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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,982	06/15/2006	Robert C. Shipman	13516-4	1560

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EXAMINER	
POHNERT, STEVEN C	
ART UNIT	PAPER NUMBER
1634	

MAIL DATE	DELIVERY MODE
03/30/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/582,982	SHIPMAN ET AL.	
	Examiner	Art Unit	
	STEVEN C. POHNERT	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *49,50 and 78* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *49,50 and 78* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim status

This action is in response to papers filed 1/21/2009.

Claims 1-48, 51-77,79-85 are canceled.

Claims 49 and 78 have been amended.

Claims 49, 50, and 78 are pending.

The objection to the claims has been withdrawn as the claims are canceled.

The 102 rejection of claims 49-50 has been withdrawn in view of the amendment, as Denfle does not teach sequences consisting of the recited SEQ ID NO.

This action is Final.

Response to Amendment

1. The Declaration under 37 CFR 1.132 filed 1/21/2009 is insufficient to overcome the rejection of claims 49, 50, and 78 based upon the 103 obviousness rejection as set forth in the last Office action because: it does not address the reference presented would result in a functional equivalent arrays to those claimed.

The declaration is by inventor Robert Shipman, PhD who has worked in the field of molecular biology since 1980. The declaration describes the teachings of Denfle as presented in the action of 8/7/2008. The response further notes that the secondary references disclosing sequences comprising the claimed probes are full length sequences. The declaration correctly identifies that the art of record does not teach nucleic acid sequences consisting of the claimed nucleic acid sequences. The declaration continues by noting the Non-final rejection of 8/7/2008 stated the claims

were obvious over the prior art absent secondary considerations. The examiner notes that the obviousness rejection was drawn to based on the teachings of the prior art the skilled artisan would be able to produce functionally equivalent probes. The declaration then provides arguments that a single PCR primer design program downloaded from the web did not select the probes of the instant invention and thus the artisan could not make primers that are equivalent to the instant claims. The response provides bioinformatic analysis of sequences provided by a primer selection program and asserts that the claimed probes have a higher score and thus the primers were not functional equivalents of those claimed. The response continues by asserting there is unpredictability of in silico designed primers as some do not work or produce more than a single PCR product. The declaration concludes in paragraph 21, that due to the unpredictability of in silico designed primers and the assertion not all primers produce a single amplification product the artisan makes the instant invention unobvious.

These arguments have been thoroughly reviewed but are not considered persuasive as the declaration asserts, “In all cases, sequences selected using computer programs need to be verified and validated and in almost all cases, the experience, knowledge and skill of a senior scientist is required to obtain a sequence that, when reduced to practice, provides the desired probe product and performance in gene expression analyses.” Thus the declaration notes that based on primers resulting from known methods of selecting primers and probes the artisan could determine which probes work and those that do not. Further the examiner notes that such selection of primers and probes to produce functionally equivalent probes may be extensive, but

would be routine experimentation as PCR amplification and probe verification is common in the art of molecular biology. Further the arguments the declaration asserts against in silico selection of primers and probes, could equally be applied to the analysis of probes (or primers), the declaration is relying upon for non-equivalence.

Finally, the declaration has not provided evidence the probes produced by the combination of the prior art of record would not produce an array comprising nucleic acids probes that are functional equivalents to those claimed. The declaration has asserted that in silico analysis of nucleic acids are unpredictable and then asserted based on in silico analysis the claimed array is non-obvious. The declaration has provided no evidence the claimed array would provide any non-obvious improvement over an array made by the references of record.

Claim Rejections - 35 USC § 103-Maintained

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 49, 50 and 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denefle et al (WO02/46458, published June 13, 2002) in view of Dean et al (Journal of Lipid Research (2001) volume 42, pages 1007-1017); Monahan et al (WO2/071928 published 19 September 2002) (only relevant pages were provided due to length of disclosure); Schmitz (WO00/18912 PUBLISHED April 6, 2000); GenBank accession AC069137.6 GI:14589784 Published July 3, 2001); Boyd et al (WO01/62977 published August 21, 2001); Gen Bank Accession U63970.1 GI:1764161 (published Jan 7, 1997); Wan et al (WO2002/74979, published September 26, 2002) (only relevant pages were provided due to length of disclosure); Kruh et al (WO99/49735 published Oct 7, 1999); GenBank Accession Z31010.1 GI:479155 (published May 11, 1995); Ota et al (EP1074617A2 published 07.02.2001) (only relevant pages were provided due to length of disclosure).

This rejection of claims 49 and 50 is drawn to the interpretation that the claims require sequences comprising SEQ ID NO 12, 15, 21, 22, 23, 24, 25, 26, 35, 44.

Denefle teaches characterization of new ABC genes will yield important transporter genes (see page 3, lines 27-29). Denefle teaches, “Thus, the probes according to the invention, immobilized on a support, may be ordered into matrices such as "DNA chips". Denefle thus teaches a microarray of ABC transporter genes.

Denefle does not teach probes consisting of SEQ ID NO 12, 15, 21, 22, 23, 24, 25, 26, 35, and 44. Denefle does not suggest the combination of probes of SEQ ID NO 12, 15, 21, 22, 23, 24, 25, 26, 35, and 44.

However, Dean et al teaches the ABC transporter family comprises 48 known ATP driven transporters, which have numerous important biological functions (see page 1007). Dean teaches the ABC family genes are known to play a role in the cell and mutations in the ABC gene transporter have been found in cystic fibrosis, neurological disease, retinal degeneration, cholesterol and bile transport defects, anemia, and drug response.

Monahan teaches sequence ABS76368 which comprises nucleotides of 3781 to 4570 are identical to SEQ ID NO 12.

Schmitz et al teaches AAZ94742 which comprises nucleotides 3082-3871 are identical to SEQ ID NO 15.

GenBank accession AC069137.6 GI:14589784 teaches nucleotides 93414 to 92662 comprising SEQ ID NO 21 of instant invention.

Boyd WO0162977 teaches GenBank accession AX282509.1 GI:16609639 nucleotides 21344 to 22003 which comprise SEQ ID NO of instant invention.

Gen Bank Accession U63970.1 GI:1764161 teaches nucleotides 4011-4820 which comprise the nucleotides of SEQ ID NO 23.

Wan teaches sequence ABZ35350 nucleotides 4566 to 5286 which comprises SEQ ID NO 24 of instant invention.

Kruh et al teach sequence AAZ30078 nucleotides 3336 to 4129 which comprises SEQ ID NO 25 of instant invention.

Kruh et al teach sequence AAZ30079 nucleotides 4964 to 5069 which comprises SEQ ID NO 26 of instant invention.

GenBank Accession Z31010.1 GI:479155 teaches nucleotides 1280 to 1767 which comprise SEQ ID NO 35 of instant invention.

Ota et al (EP1074617A2 published 07.02.2001) teaches SEQ ID NO 12961 nucleotides 1387 to 2010 which comprise SEQ ID NO 44 of instant invention.

Therefore it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use the sequences taught by Monahan et al, Schmitz, GenBank accession AC069137.6 GI:14589784, Boyd et al, Gen Bank Accession U63970.1 GI:1764161, Wan et al, Kruh et al, GenBank Accession Z31010.1 GI:479155, and Ota et al which comprise SEQ ID NO 12, 15, 21, 22, 23, 24, 25, 26, 35, 44 in the array taught by Denefle. Designing probes, which are equivalents to those taught in the art is routine experimentation. The prior art teaches the parameters and objectives involved in the selection of oligonucleotides that function as probes. Moreover there are many internet web sites that provide free downloadable software to aid in the selection of probes drawn from genetic data recorded in a spreadsheet. The prior art is replete with guidance and information necessary to permit the ordinary artisan in the field of nucleic acid detection to design probes. As discussed above, the ordinary artisan would be motivated to have designed and tested new probes to obtain additional oligonucleotides that function to detect specific SEQ ID NO

12, 15, 21, 22, 23, 24, 25, 26, 35, 44 and identify oligonucleotides with improved properties. The ordinary artisan would have a reasonable expectation of success of obtaining additional probes from the known sequences. Thus, for the reasons provided above, the ordinary artisan would have designed additional probes using the teachings in the art at the time the invention was made. The claimed SEQ ID NOs are obvious over the cited prior art, absent secondary considerations. The artisan would be motivated to combine the nucleic acid sequences taught by Monahan et al, Schmitz, GenBank accession AC069137.6 GI:14589784, Boyd et al, Gen Bank Accession U63970.1 GI:1764161, Wan et al, Kruh et al, GenBank Accession Z31010.1 GI:479155, and Ota et al because Dean teaches ABC gene transporters are important and known to play a role in human diseases including cystic fibrosis, neurological disease, retinal degeneration, cholesterol and bile transport defects, anemia, and drug response, thus determining expression would allow better diagnosis. The substitution or addition of the sequences taught by Monahan et al, Schmitz, GenBank accession AC069137.6 GI: 14589784, Boyd et al, Gen Bank Accession U63970.1 GI: 1764161, Wan et al, Kruh et al, GenBank Accession Z31010.1 GI: 479155, and Ota et al in the arrays taught by Denefle would produce a microarray with probes equivalent to the recited SEQ ID NO by replacing or adding known ABC transporter gene sequences for another. The artisan would have a reasonable expectation of success as methods of synthesizing nucleic acids and making arrays as well as the sequences of ABC transporter genes were known at the time of the invention.

Response to Arguments

The response asserts that the declaration of Dr. Shipman has been presented to verify that the claimed sequences are no way predictable based on the prior art cited. The response to Dr Shipman's declaration have been provided above. Briefly Dr. Shipman alleges that in silico analysis of nucleic acid sequences is unpredictable, then performs in silico analysis to suggest the non-equivalence of the probes. This is not persuasive for at least two reasons. First in silico analysis is asserted be unpredictable, then use of in silico analysis would not be predictable to determine if a probe or collection of probes works. Second the claims are drawn to an array, which is a solid support with nucleic acid probes. The provided declaration has provided no evidence that an array made using the required probes would have unexpected results relative to an array made by the methods of the prior art of the 103.

Finally the response asserts that the skilled artisan could not predict whether a PCR product would work. This argument has been thoroughly reviewed but is not considered persuasive as the response nor declaration has provided any experimental evidence that the probes would not work, or that the claimed arrays have unexpected properties that differentiate them from the prior art of record.

Summary

No claims are allowed.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEVEN C. POHNERT whose telephone number is (571)272-3803. The examiner can normally be reached on Monday-Friday 6:30-4:00, every second Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on 571-272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Steven Pohnert

/Sarae Bausch/
Primary Examiner AU 1634